

**UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI
NORTHERN DIVISION**

LATOYA BROWN; LAWRENCE BLACKMON;
HERBERT ANTHONY GREEN; KHADAFY
MANNING; QUINNETTA MANNING; MARVIN
MCFIELD; NICHOLAS SINGLETON; STEVEN
SMITH; BESSIE THOMAS; and BETTY JEAN
WILLIAMS TUCKER, individually and on behalf of a
class of all others similarly situated,

Plaintiffs,

v.

MADISON COUNTY, MISSISSIPPI; SHERIFF
RANDALL S. TUCKER, in his official capacity; and
MADISON COUNTY SHERIFF'S DEPUTIES JOHN
DOES #1 through #6, in their individual capacities,

Defendants.

Civil Action No.
3:17-cv-00347-WHB-LRA

**ORAL ARGUMENT
REQUESTED**

**PLAINTIFFS' MEMORANDUM OF LAW IN OPPOSITION
TO DEFENDANTS' *DAUBERT* MOTION AND MOTION *IN LIMINE*
TO EXCLUDE THE TESTIMONY OF BRYAN RICCHETTI**

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Plaintiffs Latoya Brown, Lawrence Blackmon, Khadafy Manning, Quinnetta Manning, Nicholas Singleton, Steven Smith, Bessie Thomas and Betty Jean Williams Tucker (“Plaintiffs”) respectfully submit this memorandum in opposition to Defendants’ *Daubert* Motion and Motion *In Limine* to Exclude the Testimony of Bryan Ricchetti (ECF No. 270) (“Defendants’ Motion”)¹ in this civil rights action brought against defendants Madison County, Mississippi (“Madison County”) and Sheriff Randall Tucker, sued herein in his official capacity (“Sheriff Tucker,” and with Madison County, “Defendants”). Pursuant to L.U. Civ. R. 7(b)(6)(A), Plaintiffs respectfully request oral argument on the Motion.²

PRELIMINARY STATEMENT

Dr. Ricchetti’s statistical analysis provides strong evidence that the Madison County Sheriff’s Department (“MCSD”) engages in racial discrimination by disproportionately conducting roadblocks in Black neighborhoods. Using widely accepted methodology, Dr. Ricchetti conducted a series of statistical analyses based on MCSD roadblock locations, DUIs, traffic violations, the Black population percentage of census tracts, and socioeconomic data. Dr. Ricchetti identified a statistically significant correlation between the frequency of MCSD roadblocks and Black population percentage. In other words, *even after taking into account* variations in the geographic distribution of DUI arrests, traffic violations, and socioeconomic characteristics across Madison County, Dr. Ricchetti found that MCSD roadblocks were more likely to be placed in Black neighborhoods, and the disproportionate presence of roadblocks in Black neighborhoods cannot be explained by random chance. Dr. Ricchetti’s findings provide

¹ Citations to “Def. Motion” refer to Defendants’ Memorandum in Support of Defendants’ *Daubert* Motion and Motion *In Limine* to Exclude the Testimony of Bryan Ricchetti (ECF. No. 271).

² Because the issues presented by this Motion overlap with the issues presented by Plaintiffs’ pending Motion for Class Certification (ECF No. 231), Plaintiffs request that argument on the instant Motion should be held jointly with argument on Plaintiffs’ Motion for Class Certification.

evidence that MCSD unconstitutionally takes race into account when selecting roadblock locations.

Faced with this powerful evidence of unconstitutional racial discrimination, Defendants have asserted several flawed arguments in an attempt to exclude Dr. Ricchetti's report. The majority of Defendants' Motion focuses on "geocoding," which is the process of plotting locations on a map. Defendants claim that Dr. Ricchetti's entire statistical analysis must be discarded because he allegedly did not apply a proper "geocoding methodology" when he assigned MCSD roadblock locations to census tracts. Defendants' geocoding-related arguments attempt to overcomplicate what was a straightforward process and a minor part of Dr. Ricchetti's expert analysis. Defendants rely heavily on the opinions of a geographer, William Funderburk. Mr. Funderburk's report misunderstands the purpose of Dr. Ricchetti's geocoding, relies on the unverified factual assertions of MCSD personnel, and draws erroneous conclusions based on unreliable methodology and a lack of familiarity with basic statistical concepts.³ Moreover, Mr. Funderburk's claims have been refuted by Dr. Ricchetti's own analyses and by Dr. Patricia Frontiera, a geocoding expert who has confirmed that Dr. Ricchetti's geocoding was sufficiently reliable for purposes of Dr. Ricchetti's analysis. Accordingly, Defendants have no basis for their assertion that Dr. Ricchetti made geocoding errors, let alone that these purported errors undermine Dr. Ricchetti's statistical analysis.

Defendants also criticize the reliability of Dr. Ricchetti's statistical analysis. Based on the opinions of Dr. Dwight Steward, who conducted little to no independent analysis of his own, Defendants misconstrue Dr. Ricchetti's findings, attempt to discredit Dr. Ricchetti's widely accepted methodology, and accuse Dr. Ricchetti of failing to conduct analyses he in fact

³ Plaintiffs have moved to exclude the report and testimony of Mr. Funderburk.

conducted. As confirmed by Dr. Justin McCrary, an expert in academic literatures concerning crime and concerning racial discrimination, Dr. Ricchetti's methodology is widely used in academic studies and has been accepted by courts. In addition, each of Dr. Steward's critiques of Dr. Ricchetti's methodology are easily rebutted.

Dr. Ricchetti's report is based on sufficient data and reliably applies widely accepted statistical methodology. Accordingly, Dr. Ricchetti's report satisfies the requirements of Federal Rule of Evidence 702 and the Court should deny Defendants' *Daubert* Motion and Motion *In Limine* to Exclude the Report of Bryan Ricchetti.

BACKGROUND

I. DR. RICCHETTI'S REPORT

Plaintiffs' Motion for Class Certification seeks to certify a class and two subclasses consisting of Black individuals subject to the unconstitutional racially discriminatory policing practices of the Madison County Sheriff's Department. Specifically, Plaintiffs move for certification of "a class of all Black persons who presently or in the future will reside in or travel through Madison County" (the "Targeting Class") and two subclasses: "all Black persons who travel or will travel by car through majority Black areas of Madison County" (the "Roadblock Subclass") and "all Black persons who travel or will travel by foot in Madison County's majority-Black neighborhoods" (the "Pedestrian Stop Subclass"). Memorandum of Law in Support of Plaintiffs' Motion for Class Certification (ECF No. 232), at 2. In support of Plaintiffs' Motion for Class Certification, Plaintiffs submitted the expert report of Dr. Bryan Ricchetti ("Dr. Ricchetti's Report" or "Ricchetti Rep."). Dr. Ricchetti's Report provides statistical confirmation that the MCSD engages in policing practices that disproportionately impact Black neighborhoods in Madison County.

Dr. Ricchetti is an economist and co-head of Cornerstone Research’s antitrust practice. *See* Ex. 1, Ricchetti Rep. ¶ 1. Dr. Ricchetti has a Ph.D. in Economics from Cornell University and has “seventeen years of professional experience analyzing economic data related to socioeconomic and demographic characteristics (including race) and economic outcomes.” *Id.* ¶ 1. Dr. Ricchetti has served as an expert witness in numerous cases, including cases involving claims of discrimination. *See id.* ¶¶ 3-4. Defendants do not challenge Dr. Ricchetti’s qualifications as an expert.⁴

Dr. Ricchetti conducted statistical analyses to determine “whether there is a relationship between the location and frequency of [MCSD] roadblocks and the percentage of the population that is Black in communities where roadblocks are set up.” *Id.* ¶ 7. Dr. Ricchetti reviewed and analyzed data that MCSD produced in this litigation as well as publicly available U.S. Census Bureau socioeconomic and demographic data for each census tract in Madison County. *Id.* ¶ 8.

Dr. Ricchetti performed a multiple regression analysis to understand the statistical relationship between the frequency of MCSD roadblocks and the Black population of the census tracts in which the roadblocks are located. Dr. Ricchetti’s regression analysis accounted for six control variables which might explain differences in the locations of roadblocks: (1) DUI arrests per 1,000 people; (2) Traffic arrests and citations per 1,000 people; (3) Percentage of households with at least one vehicle; (4) Percentage of population between ages 15-24; (5) Median household income; and (6) Unemployment rate. *Id.* ¶ 45. Dr. Ricchetti’s regression model found a statistically significant correlation between the number of roadblocks and the Black population

⁴ Defendants claim, in passing, that Dr. Ricchetti has a “lack of relevant experience,” seemingly because he “is not an expert in law enforcement techniques.” Defs.’ Motion, at 2. However, Defendants do not assert Dr. Ricchetti’s alleged lack of experience as a basis for excluding his report, and his results are based on generally accepted statistics, not police expertise.

percentage of census tracts, indicating that “even after controlling for variables that are predictive of differences in traffic behavior, roadblocks are statistically significantly more likely to occur in areas with a higher percentage of Black residents.” *Id.* ¶ 46.⁵

Dr. Ricchetti’s Report also presents a series of descriptive analyses identifying patterns in the location and frequency of MCSD roadblocks across Madison County’s 21 census tracts. These descriptive analyses provide background for the statistical tests Dr. Ricchetti runs in his regression analysis. Dr. Ricchetti’s analysis of MCSD roadblock locations revealed that, controlling for population, MCSD roadblocks are more likely to be located in census tracts with a relatively higher Black population percentage. Specifically, Dr. Ricchetti found that the census tracts with a relatively low Black population (10-28%) had 14 roadblocks per 1,000 citizens, while the census tracts with a relatively high Black population percentage (46-89%) had 28 roadblocks per 1,000 citizens. *See id.* ¶ 39. In other words, the frequency of roadblocks in the census tracts with a relatively high Black population was twice as high as the frequency of roadblocks in the census tracts with a relatively low Black population percentage.

Dr. Ricchetti also calculated the number of roadblocks per 100 DUI arrests and per 100 traffic arrests and citations to determine whether the patterns of roadblocks might be explained

⁵ Contrary to Defendants’ claim, Dr. Ricchetti did not confirm that “race is not a factor in the placement of roadblocks.” Defs.’ Motion, at 7. While Dr. Ricchetti found that DUIs explain a significant percentage of the variation in roadblock locations, his report also found that race was a statistically significant factor in determining roadblock locations. Defendants also incorrectly claim that Dr. Ricchetti admitted in his deposition that his analysis “does not address whether the MCSD locates roadblocks for racial reasons.” Dr. Ricchetti was making the obvious point that statistical analysis does not provide direct evidence of whether law enforcement has a subjective intent to engage in racial discrimination. *See Ricchetti Tr.* 216:15-217:14, 226:13-22. Statistical analysis, such as Dr. Ricchetti’s, has long been accepted as evidence of racial discrimination. *See, e.g., Int’l Bhd. of Teamsters v. United States*, 431 U.S. 324, 339-40 (1977) (“[O]ur cases make it unmistakably clear that statistical analyses have served and will continue to serve an important role in cases in which the existence of discrimination is a disputed issue.”); *Burns v. Thiokol Chem. Corp.*, 483 F.2d 300, 305 (5th Cir. 1973) (“In the problem of racial discrimination, statistics often tell much, and Courts listen.”).

by varying rates of unsafe driving behavior across different census tracts. *See id.* ¶ 41. Dr. Ricchetti found that the number of roadblocks per 100 DUI arrests was 41% higher in the census tracts with a relatively high Black population percentage and the number of roadblocks per 100 traffic arrests and citations was 40% higher in census tracts with a relatively high Black population percentage. *See id.* ¶¶ 41-42. Ultimately, Dr. Ricchetti observed that “(a) roadblocks are more likely to be placed in census tracts with a higher percentage of Black residents, (b) roadblocks are sometimes clustered in large numbers in certain neighborhoods, and (c) the relatively higher frequency of roadblocks cannot be explained by a relatively higher number of DUI arrests or traffic arrests and citations.” *Id.* ¶ 43.

II. DEFENDANTS’ REBUTTAL REPORTS

Defendants’ Motion focuses on two aspects of Dr. Ricchetti’s Report: (1) the process by which Dr. Ricchetti geocoded (*i.e.* plotted on a map) the locations of MCSD roadblocks to determine the census tract in which each roadblock was located, and (2) the statistical analysis Dr. Ricchetti conducted to determine that there is a statistically significant correlation between MCSD roadblocks and the Black population percentage of census tracts within Madison County. With respect to geocoding, Defendants rely heavily on the rebuttal report of William Funderburk. Mr. Funderburk’s report misunderstands the purpose of Dr. Ricchetti’s geocoding, alleges geocoding “errors” based solely on the representations of MCSD personnel, and makes unsupported assertions (beyond the scope of his expertise) that alleged geocoding errors undermine the results of Dr. Ricchetti’s statistical analysis.⁶ Contrary to Mr. Funderburk’s unreliable assertions, Defendants’ geocoding expert, Dr. Patricia Frontiera, has confirmed that

⁶ As explained in more detail in Plaintiffs’ Motion to Exclude the Report and Testimony of William R. Funderburk, Mr. Funderburk’s report must be excluded in its entirety because it is methodologically unsound, irrelevant, and otherwise inadmissible.

Dr. Ricchetti's geocoding practices were reliable and Dr. Ricchetti's own analysis confirms that any alleged geocoding errors do not affect the conclusions of his statistical analysis.

The rebuttal report of Defendants' statistical expert, Dr. Dwight Steward, mischaracterizes Dr. Ricchetti's methodology, misstates the academic literature, and makes unsupported assertions about alleged errors in Dr. Ricchetti's methodology. Dr. Steward's report is not based on an independent analysis. *See, e.g.*, Ex. 8, Dwight Steward Deposition Transcript (June 22, 2018) ("D. Steward Tr.") 141:25-13 ("Q. And you're saying that your role here, you saw it as being a rebuttal to what Dr. Ricchetti's work was as opposed to doing your own kind of independent, affirmative analysis of kind of the data here in this case? . . . A. [O]ne of my roles is a rebuttal expert. That's the title of the report. And then I looked at the information. But at this point I haven't been asked to do a separate analysis."). Rather, Dr. Steward's report asserts a variety of untested critiques in an attempt to poke holes in Dr. Ricchetti's analysis.⁷ Moreover, Dr. Steward's report reveals an incomplete understanding of Dr. Ricchetti's methodology. For example, Dr. Steward accuses Dr. Ricchetti of failing to conduct analysis that Dr. Ricchetti did in fact conduct and makes basic statistical errors about the nature of Dr. Ricchetti's analysis and the meaning of his findings. As explained in the Expert Report of Dr. Justin McCrary, an expert on statistical analysis related to discrimination and crime, Dr. Ricchetti's analysis is consistent with widely accepted methodology used to assess racial discrimination both in the academic and

⁷ Dr. Steward has provided expert testimony in more than 35 cases in the past four years and has provided testimony in "eight or nine" cases between February and June of this year alone. *See* Ex. 5, Rebuttal Report of Dwight D. Steward, Ph.D. RE: Bryan Ricchetti ("Steward R.R."), at Exhibit A; Ex. 8, D. Steward Tr. 41:12-19. Dr. Steward's testimony has previously been excluded because, among other things "Dr. Steward never explicitly testified or reported that his methodology is routinely used among economic experts or that his method . . . is generally accepted." *Young v. Brand Scaffold Servs., LLC*, No. 1:07-CV-917, 2009 WL 4674053, *4 (E.D. Tex. Mar. 16, 2009). The court also found that there was an analytical gap between the facts Dr. Steward analyzed and the conclusion Dr. Steward drew from those facts, noting that "[h]ere, the gap is an abyss." *Id.* at *5.

litigation contexts. In addition, Dr. Ricchetti's Rebuttal Report provides robust analysis contradicting Dr. Steward's untested critiques of Dr. Ricchetti's analysis. Dr. Steward's report does not advance any compelling critiques of Dr. Ricchetti's Report and does not provide a basis for excluding Dr. Ricchetti's expert testimony.

ARGUMENT

I. LEGAL STANDARD

“‘[T]he rejection of expert testimony is the exception and not the rule.’” *Johnson v. Samsung Electronics America, Inc.*, 277 F.R.D. 161, 165 (E.D. La. 2011) (citing Fed. R. Evid. 702 Advisory Committee Notes to 2000 Amendments). Mere disagreement with an expert's methodology and conclusions is not a sufficient basis to exclude expert testimony. *See, e.g., Graves ex rel. W.A.G. v. Toyota Motor Corp.*, No. 2:09cv169KS-MTP, 2011 WL 4625403, *7 (S.D. Miss. Oct. 3, 2011) (“[The court understands that [the movant's] experts disagree with [the non-movant's expert] but that does not make [the non-movant's expert's] opinions inadmissible or unreliable, only prejudicial to [the movant's] theory of the case.”). In particular, “‘questions relating to the bases and sources of an expert's opinion affect the weight to be assigned that opinion rather than its admissibility and should be left for the jury's consideration.’” *United States v. 14.38 Acres of Land, More or Less Situated in Leflore Cty., State of Mississippi*, 80 F.3d 1074, 1077 (5th Cir. 1996) (quoting *Viterbo v. Dow Chemical Co.*, 826 F.2d 420, 422 (5th Cir. 1987)). Exclusion of an expert report is especially inappropriate where the movant complains about the reliability of data the movant itself produced. *See Kelly v. Paschall*, Civil No. W-03-CA-179, 2005 WL 5988658, at *4 (W.D. Tex. Apr. 19, 2005) (“Dr. Steward received the Task Force case log from the Defendants and the Defendants are now arguing that the data is unreliable. This is a matter that the Defendants can raise through cross-examination, but it is not a basis for excluding the testimony all together.”).

The Fifth Circuit has emphasized that “[i]t bears reminding that ‘the trial court’s role as gatekeeper [under *Daubert*] is not intended to serve as a replacement for the adversary system.’ Rather, as *Daubert* makes clear, ‘vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.’” *Pipitone v. Biomatrix, Inc.*, 288 F.3d 239 (5th Cir. 2002)(citing Fed. R. Evid. 702 advisory committee’s note and *Daubert*, 509 U.S. at 596). Moreover, “the gatekeeping function of the [c]ourt is relaxed” when the court is acting as both factfinder and gatekeeper. *See Dreher v. State Farm Mutual Auto. Ins. Co.*, Civil No. 1:15-cv-23-JCG, 2016 WL 3277948, at *3 (S.D. Miss. Jan. 15, 2016); *see also In re Salem*, 465 F.3d 767, 777 (7th Cir. 2006) (“[W]here the factfinder and the gatekeeper are the same, the court does not err in admitting the evidence subject to the ability later to exclude it or disregard it if it turns out not to meet the standard of reliability established by Rule 702.”); *Gibbs v. Gibbs*, 210 F.3d 491, 500 (5th Cir. 2000) (“Most of the safeguards provided for in *Daubert* are not as essential in a case such as this where a district judge sits as the trier of fact in place of a jury.”).⁸

II. THE COURT SHOULD DENY DEFENDANTS’ MOTION TO EXCLUDE DR. RICCHETTI’S EXPERT REPORT

Dr. Ricchetti conducted a robust statistical analysis based on reliable and widely accepted methodology. Defendants’ critiques of Dr. Ricchetti’s Report are based on misunderstandings and mischaracterizations of Dr. Ricchetti’s methodology. Defendants make unsupported allegations of errors in Dr. Ricchetti’s methodology and then fail to plausibly explain how any of these purported errors affect the results of Dr. Ricchetti’s statistical analysis. *First*, Defendants

⁸ Defendants cite to cases discussing potential financial incentives that may cause an expert to lower their professional standards in connection with expert testimony. Defs.’ Motion, at 10. Dr. Ricchetti is providing his expert services in this case on a *pro bono* basis. *See* Ex. 1, Ricchetti Rep. ¶ 6. In contrast, Defendants are compensating Dr. Steward at a rate of \$595 per hour. *See* Ex. 5, Steward R.R., at Exhibit A.

argue that Dr. Ricchetti's statistical analysis is flawed because he allegedly did not use reliable methods to geocode the locations of MCSD roadblocks and because the data MCSD itself produced is unreliable. Defendants' allegations of geocoding-related errors are unfounded. Defendants have also failed to provide any support for their assertions that the alleged geocoding-related errors affected Dr. Ricchetti's statistical analysis. To the contrary, basic statistical principles—confirmed by Dr. Ricchetti's own tests—demonstrate that geocoding-related errors, if any, do not change or cast into doubt Dr. Ricchetti's findings. *Second*, Defendants claim that Dr. Ricchetti "relied on an arbitrary threshold for separating Madison County's census tracts into White and Black categories." Defs.' Motion, at 16. This critique is based on a misunderstanding of the nature and purpose of Dr. Ricchetti's descriptive analysis, which is the standard and generally accepted practice of providing a summary overview of relevant patterns in conjunction with a formal statistical analysis (in this case, Dr. Ricchetti's regression model). None of Dr. Ricchetti's statistical findings depend on separating Madison County's census tracts by any particular "threshold." *Finally*, Defendants claim that Dr. Ricchetti's multiple regression model improperly relies on census demographics and does not adequately account for variables in traffic behavior that might explain differences in roadblock frequencies. These critiques also fall flat. As explained in his report, Dr. Ricchetti's model has direct controls for relevant traffic behavior (DUIs and traffic citations). Dr. Ricchetti's use of census data, *in addition to* direct controls for traffic behavior, is a widely accepted methodology that is regularly used in statistical analysis of racial discrimination. Accordingly, Defendants' motion to exclude Dr. Ricchetti's Report should be denied because Dr. Ricchetti's Report is relevant and based on sufficient facts and reliable methods.

A. Dr. Ricchetti's Assignment Of Roadblock Locations To Census Tracts Is Reliable And Any Alleged Errors Do Not Change Dr. Ricchetti's Conclusions

“Geocoding” refers to the straightforward process by which Dr. Ricchetti assigned MCSD roadblock locations to census tracts. This process consisted of reviewing MCSD’s records of roadblock addresses and then entering the addresses into a computer program, called ArcGIS⁹, to identify the census tract in which each roadblock was located *See* Ex. 1, Ricchetti Rep. ¶ 23 n.14; Ex. 7, Bryan Ricchetti Deposition Transcript (“B. Ricchetti Tr.”) 167:25-168:3. Defendants claim that Dr. Ricchetti’s methodology of assigning roadblocks to census tracts was flawed for two reasons. First, Defendants argue that “the generic address descriptions maintained by MCSD do not provide sufficiently specific information from which to geocode.” Defs.’ Motion, at 12. Second, Defendants contend that some of Dr. Ricchetti’s geocoded locations do not correspond to the “actual locations” of roadblocks. *Id.* at 13-14. Third, Defendants claim that Dr. Ricchetti allegedly did not account for the possibility that roadblocks may “straddle two or more census tracts.” *Id.* at 14-15. These criticisms are without merit: The records of roadblock locations are sufficiently precise for geocoding roadblocks within census tracts; Mr. Funderburk’s allegations about specific geocoding flaws are inappropriately based on MCSD personnel’s representations concerning a statistically unreliable sample of roadblock locations; and there is no evidence that the presence of roadblocks near census tract borders biased Dr. Ricchetti’s analysis in any way. However, even if these criticisms had merit (which they do not), Defendants have provided no basis for their assertion that Dr. Ricchetti’s process of assigning roadblock locations to census tracts affects the results of his statistical analysis. In fact, Dr. Ricchetti has conducted additional tests based on widely accepted methods in the academic

⁹ “Geocoding with ArcGIS is widely used because it is very highly regarded.” Ex. 3, Rebuttal Expert Report of Patricia Frontiera, Ph.D. (July 2, 2018) (“Frontiera R.R.”) ¶ 18.

literature which have confirmed that any geocoding-related errors would not change the results of his statistical analysis.

1. Dr. Ricchetti Should Not Be Faulted For Alleged Imperfections In MCSD's Records Concerning Roadblock Locations.

Defendants contend that Dr. Ricchetti's geocoding is not reliable because there are flaws in Defendants' own recording of roadblock locations. Defendants' criticisms of their own data do not, and cannot, undermine Dr. Ricchetti's methodology. As discussed below, the roadblock information is sufficiently reliable for purposes of Dr. Ricchetti's model. Moreover, it is improper to exclude an expert report based on alleged flaws in the moving party's own data. In *Kelly v. Paschall*, the defendants challenged an expert report submitted by Dr. Dwight Steward—Defendants' expert in this case. The defendants argued that Dr. Steward's report should be excluded because his opinion relied on a purportedly incomplete data set provided by the defendants. The court declined to exclude Dr. Steward's report, noting that “no source of information can be perfect” and “Dr. Steward used the best available data which was mostly provided by Defendants [*i.e.*, the moving party].” 2005 WL 5988658, at *4. The court stated that the potential unreliability of the data is an issue that could be raised on cross-examination “but is not a basis for excluding the testimony all together.” *Id.*; *see also, e.g., Mister v. Illinois Cent. Gulf R.R. Co.*, 832 F.2d 1427, 1430 (7th Cir. 1987) (rejecting the defendant's criticisms of plaintiff's expert's findings due to “bad data” because “[t]he plaintiff's expert used the best data available; that the data were not better is the [defendant's] fault, and we agree . . . that the data at hand were good enough even though imperfect.”).

2. Dr. Ricchetti Reliably Assigned Roadblock Locations To Census Tracts

(a) MCSD Roadblock Data Is Sufficiently Detailed And Reliable For The Purpose Of Assigning Roadblocks To Census Tracts

MCSD's roadblock records provided enough information for Dr. Ricchetti to assign roadblock locations to census tracts. Defendants note that while the roadblock locations are often listed as intersections, the roadblock may have actually been positioned at one corner of the intersection or at one of the approaches to the intersection. Even if this is true, Defendants provide no basis to conclude that the difference between, for example, the northwest corner of an intersection and the southeast corner, or the difference between the center of an intersection and a location a few hundred feet east of the intersection, would make a difference for purposes of Dr. Ricchetti's analysis. The lack of an exact address is not an obstacle to plotting roadblocks in broader *census tracts*. Indeed, Dr. Patricia Frontiera, an expert in geospatial analysis, reviewed Dr. Ricchetti's analysis and concluded that the positional accuracy of the geocoded points in Dr. Ricchetti's Report is sufficient to identify the census tract in which a roadblock was located and that "street intersections can be geocoded with a higher level of positional accuracy than street addresses." *See* Ex. 3, Frontiera R.R. ¶¶ 14, 31.

(b) Alleged Discrepancies Between The Geocoded Location of Roadblocks And The "Actual Location" Of Roadblocks As Identified By MCSD Personnel Do Not Render Dr. Ricchetti's Geocoding Unreliable

Defendants claim that Dr. Ricchetti's geocoding is unreliable because Dr. Ricchetti did not "confirm" or "verify" the actual location of the roadblocks described in MCSD records. Defs.' Motion, at 14. In support of this point, Defendants cite to a list of allegedly incorrect geocoding locations purportedly identified by Mr. Funderburk and MCSD personnel. This critique is wrong for several reasons.

First, Mr. Funderburk's and MCSD's claims about inaccuracies in the roadblock records are unreliable because they are not based on a review of a statistically random sample of roadblock locations. *See* Ex. 3, *Frontiera R.R.* ¶¶ 10, 53; Ex. 9, William Funderburk Deposition Transcript ("W. Funderburk Tr.") 160:25—161:2 ("This was not a random subset of this data."). Rather, Mr. Funderburk interviewed MCSD Deputy Rylon Thompson and relied on Deputy Thompson's representations about the "actual locations" of an arbitrary subset of MCSD roadblocks without conducting any independent analysis or even confirming that Deputy Thompson was present at each of the roadblocks at issue. *See* Ex. 6, Rebuttal Report of William R. Funderburk (May 8, 2018) ("*Funderburk R.R.*") ¶ 46; Ex. 9, *W. Funderburk Tr.* 62:22-63:2 ("Q. And so the bases for your statement that that's where the roadblocks actually occurred, that's where Deputy Thompson identified them as having occurred? A. Yes."). Accordingly, and as discussed in Plaintiffs' motion to exclude Mr. Funderburk's report and testimony, Mr. Funderburk's process of selecting a sample of roadblock locations was biased, inconsistent with accepted methodology, and cannot be relied upon to extrapolate the frequency of the non-sampled geocoding locations. *See* Ex. 3, *Frontiera R.R.* ¶¶ 46, 54.

Second, Dr. Frontiera conducted her own review of 22 alleged geocoding errors described in Mr. Funderburk's report. Dr. Frontiera concluded that "only one point could be considered a geocoding positional accuracy error." *Id.* ¶ 59. In Dr. Frontiera's opinion, Mr. Funderburk's "analysis does not support his conclusions that Dr. Ricchetti's geocoding contains 'a variety of errors in geopositional accuracy and precision.'" *Id.* ¶ 61. Further, in addition to reviewing the roadblock points assessed by Mr. Funderburk, Dr. Frontiera reviewed the geocoding methods used by Dr. Ricchetti – including the use of a match score to ensure accuracy. Dr. Frontiera concluded that "Dr. Ricchetti's initial report followed best practices

resulting in a high level of overall geocoding quality,” *id.* ¶ 9, and that “the use of the match score in Dr. Ricchetti’s report is consistent with standard practice.” *Id.* ¶ 42.

Finally, to the extent there are any potential discrepancies between the recorded location of a roadblock and the actual location of a roadblock, they do not undermine the reliability of Dr. Ricchetti’s geocoding. Rather, any such discrepancies are instances of measurement error, which can be accounted for in statistical analyses. *See id.* ¶ 20 (stating that “most of the geocoding critiques of Dr. Ricchetti’s analysis identified by Mr. Funderburk stem from incomplete information in the data provided by MCSD rather than from geocoding errors This is, however, not a geocoding problem and rather a geographical problem that can be assessed through variety of robustness analyses.”). The concept of measurement error is discussed in more detail below, in Section II.A.3.b.

(c) The Presence Of Roadblocks Near Census Tract Boundaries Does Not Pose A Problem For Dr. Ricchetti’s Geocoding Analysis

Defendants also argue that Dr. Ricchetti’s geocoding is flawed because it does not reliably account for roadblocks that “straddle two or more census tracts.” Defs.’ Motion, at 14-15. To evaluate this claim, Dr. Frontiera used the ArcGIS computer program (the same widely accepted program used by Dr. Ricchetti) to determine whether any of the geocoded locations of roadblocks were plotted *on the border* of census tracts. Dr. Frontiera found that “none of the roadblock points spatially intersect census tract boundaries.” *Id.* ¶¶ 77-78.¹⁰ Nonetheless, Dr. Frontiera conducted additional analysis to assess whether slight variations in the plotting of each location may have mis-assigned roadblock locations in a way that could bias Dr. Ricchetti’s findings. Dr. Frontiera conducted an analysis of roadblock locations located near the boundaries

¹⁰ ArcGIS identified each roadblock location as being fully within a single census tract. *Id.*

between census tracts with a relatively high Black population and census tracts with a relatively low Black population. *See id.* ¶¶ 81-88. Dr. Frontiera found that “there were more roadblocks that could have been assigned to tracts with a higher black population than roadblocks that could have been assigned to tracts with a lower black population.” *Id.* ¶ 88. In other words, Dr. Ricchetti’s process of assigning roadblock locations near census boundaries most likely *understated* the number of roadblocks in census tracts with a relatively high Black population percentage. Dr. Frontiera’s findings are consistent with the additional sensitivity tests conducted by Dr. Ricchetti (described in more detail below), which determined that alleged errors associated with roadblock locations near census tract boundaries do not affect the results of Dr. Ricchetti’s analysis.

3. Alleged Geocoding-Related Errors, If Any, Do Not Affect The Results Of Dr. Ricchetti’s Statistical Analysis

Defendants have provided no basis for asserting that the alleged geocoding-related errors, if any, undermine the reliability of Dr. Ricchetti’s statistical analysis. Claims of errors in the underlying data do not provide a sufficient basis for excluding an expert opinion, unless it can be shown that these alleged flaws or errors affected the ultimate conclusions of the expert’s analysis. *See Kelly v. Paschall*, 2005 WL 5988648, at *4 (“The Defendants also raised several arguments pointing to alleged errors that Dr. Steward made during the process of his statistical analysis when entering specific data. However, the Defendants have not shown how any of these alleged errors would affect the underlying results of Dr. Steward’s analysis. Again, this is the type of argument that goes to the weight of the evidence, not to its admissibility.”).

(a) Defendants' Experts Did Not Conduct A Statistical Analysis To Determine What, If Any, Effect Alleged Geocoding Errors Had On Dr. Ricchetti's Analysis

Defendants rely on the unsupported assertions of Defendants' economist expert, Dr. Dwight Steward, and Defendants' geocoding expert, William Funderburk, in support of their argument that alleged geocoding-related errors undermine Dr. Ricchetti's statistical analysis. Defendants cite Dr. Steward's report for the proposition that purported geocoding-related errors "inject[] further error into Dr. Ricchetti's analysis." Defs.' Motion, at 16 (citing Ex. 5, Steward R.R. ¶¶ 41-42.). However, Dr. Steward's report provides no statistical analysis regarding the effect of geocoding errors, if any, on Dr. Ricchetti's statistical analysis. *See, e.g.*, Ex. 8, D. Steward Tr. 195:6-12 ("Q. And beyond what you've read in Mr. Funderburk's report, which I think you said you reviewed as part of your deposition preparation for today, you didn't do any sort of further analysis or tests of what Mr. Funderburk did in terms of his report in this case; is that correct? A. That's correct."); *id.* 204:10-205:9. Mr. Funderburk states in his report that "[g]iven [Dr. Ricchetti] used invalid geographic layers and coinciding datasets to build his data, Dr. Ricchetti's statistical analysis would be unreliable and invalid." Ex. 6. Funderburk R.R. ¶ 86. Yet Mr. Funderburk confirmed in his deposition that this conclusion is not based on any statistical analysis. Ex. 9, W. Funderburk Tr. 163:15-19 (Q: "But you didn't do any statistical analysis that would confirm or refute Dr. Ricchetti's statistical analysis? A: No, sir. I wasn't paid to do any statistical analysis here."). Moreover, Mr. Funderburk stated that he was not familiar with the basic statistical concept of measurement error. *See id.* 15:24-16:2 ("Q. Are you familiar with the concept classical measurement error? A. Not off the top of my head."). As discussed below, the concept of measurement error is essential to understanding why the alleged errors in MCSD's data and Dr. Ricchetti's geocoding do not affect the statistical reliability of Dr. Ricchetti's conclusions.

(b) Measurement Error Does Not Bias Dr. Ricchetti's Statistical Analysis

Defendants' arguments about the statistical impact of Dr. Ricchetti's geocoding fail to account for the basic statistical principle of measurement error. According to Dr. Justin McCrary, an expert on measurement error, "[i]t is well understood in economics and statistics that nearly all data sources have imperfections in them that introduce the possibility of what economists refer to as measurement error." Ex. 4, Rebuttal Expert Report of Justin McCrary, Ph.D. (July 2, 2018) ("McCrary R.R.") ¶ 35. However, "the existence of measurement error in the dependent variable (the issue Dr. Steward focused on) typically has *no effect* on the reliability of a regression model." In fact, measurement error "makes it *harder* to find a statistically significant effect for any variable in the model." *Id.* ¶ 36. In other words, according to basic statistical principles, one would expect that geocoding-related errors would either (1) have no effect on Dr. Ricchetti's findings or (2) *understate* the extent to which racial demographics explain MCSD's placement or roadblocks. The reason for this is intuitive—errors in the measurement of data are likely to be random and random error will not bias statistical results in any particular direction. For example, if there are random errors related to roadblock locations straddling census tracts, one would expect that the roadblock locations would be mis-assigned to the tract with the relatively lower Black population about as often as they are mis-assigned to the tract with the relatively higher Black population. Moreover, the presence of measurement error is likely to make a regression model more conservative because measurement error "increase[s] the variance of the model, which makes it harder to find a statistically significant effect for any variable in the model." *Id.* ¶ 36. Nonetheless, it is possible to conduct statistical tests to determine the effect, if any, of measurement error on statistical analysis. While Dr. Steward and Mr. Funderburk did not

conduct any tests, Dr. Ricchetti conducted statistical tests and confirmed that geocoding-related measurement error does not change his conclusions.

In connection with his Rebuttal Report, Dr. Ricchetti conducted standard and well-accepted sensitivity tests to determine whether the alleged geocoding-related errors might have impacted his statistical conclusions. *See* Ex. 2, Rebuttal Expert Report of Bryan Ricchetti, Ph.D. (“Ricchetti R.R.”) ¶¶ 61-62. When Dr. Ricchetti removed from his analysis roadblocks that are near a border between census tracts there was no effect on Dr. Ricchetti’s statistical findings. *See id.* ¶ 65. Dr. Ricchetti conducted another sensitivity test in which he did not remove border roadblocks, but instead assigned each of the border roadblocks to the census tract with the *lowest* Black population percentage. *Id.* Even applying this assumption, Dr. Ricchetti’s statistical analysis was undisturbed—his model still found a statistically significant relationship between roadblocks and racial demographics. *Id.*

B. Defendants Mischaracterize And Misunderstand the Meaning Of Dr. Ricchetti’s Descriptive Analysis

Defendants misunderstand and mischaracterize Dr. Ricchetti’s descriptive analysis of patterns in MCSD roadblock locations. The purpose of Dr. Ricchetti’s statistical analysis is to provide a “descriptive overview of the patterns in key variables.” *Id.* ¶ 44.¹¹ This analysis is distinct from Dr. Ricchetti’s regression model, which is his formal statistical analysis. *Id.*¹² Many

¹¹ This type of analysis is standard in academic papers. *Id.*; *see also* Ex. 4, McCrary R.R. ¶ 28 (“Dr. Ricchetti’s use of summary statistics to describe relevant patterns in the data before running his full regression model is a common approach in nearly every academic paper that uses regression.”).

¹² Dr. Ricchetti’s Report explains the difference between the descriptive analysis and the formal regression analysis: “I start my analysis in Section 4.1 with a set of descriptive analyses that highlight the general patterns in the location and frequency of roadblocks across the 21 different census tracts in Madison County. I show that the frequency of roadblocks is generally higher in census tracts with a substantially higher percentage of Black residents. In Section 4.2, I then present the findings of my regression analysis, where I formally test whether the frequency of roadblocks is higher in census tracts with a higher percentage of Black residents, controlling for other factors that are predictive of differences in traffic behavior.” Ex. 1, Ricchetti Rep. ¶¶ 35-36.

of Defendants' critiques of Dr. Ricchetti's report conflate Dr. Ricchetti's descriptive analysis with his formal regression model analysis.¹³

Defendants claim that Dr. Ricchetti "relied on an arbitrary threshold for separating Madison County's 21 census tracts into White and Black categories" and Dr. Ricchetti "cites no support for his decision to use 46.2% as the threshold for when a census tract should be considered Black." Defs.' Motion, at 16. However, Dr. Ricchetti's grouping of the census tracts is not arbitrary at all. Rather, it is an intuitive interpretation of the Black population percentages in Madison County's 21 census tracts, which include a cluster of census tracts with a relatively high Black population (46-89%) and a cluster of census tracts with a relatively low Black population (10-28%). Dividing the tracts into these categories is also consistent with generally accepted methodology. As Dr. Ricchetti explained in his report, "[t]he variation across census tracts in Madison County allows for" comparisons between census tracts with a relatively high Black population and census tracts with a relatively low population. Ex. 1, Ricchetti Rep. ¶ 33 n.20 (citation omitted). "This type of research design, in which a single variable cleanly delineates two groups of people with and without a characteristic of interest, is a widely used research design in economic research that allows for quantification of the effect of that characteristic on relevant outcomes." *Id.* To be clear, Dr. Ricchetti **did not** divide census tracts into "high" and "low" Black population groupings for purposes of his formal regression analysis. *See* Ex. 2, Ricchetti R.R. ¶ 46.¹⁴ Dr. Ricchetti's regression "test[ed] for a general relationship

¹³ For example, Dr. Steward criticizes Dr. Ricchetti for not conducting a statistical significance test in connection with the descriptive analysis. *See* Ex. 5, Steward R.R. ¶ 67. However, such a test is neither required nor appropriate for descriptive analysis. *See* Ex. 2, Ricchetti R.R. ¶¶ 44-45.

¹⁴ Defendants' calculation of the number of roadblocks based on a 50% Black population threshold is arbitrary and misleading. *See* Defs' Motion, at 16-17. It is arbitrary because the 50% threshold is not based on patterns actually present in the census tract data. It is misleading because Defendants rely on

between roadblocks and the racial breakdown across census tracts (controlling for other factors)” and his statistical analysis is not based on any assumptions about whether a particular census tract had a “high” or “low” Black population. *Id.*

C. Dr. Ricchetti’s Use Of Census Demographic Data Is Consistent With Accepted Methodology And Dr. Ricchetti Properly Accounted For Variables Related To Driving Behavior

Defendants’ criticisms of “census benchmarking” mischaracterize the academic literature and incorrectly accuse Dr. Ricchetti of failing to conduct analysis that he actually conducted. Defendants assert two criticisms of Dr. Ricchetti’s multiple regression analysis. First, Defendants claim that Dr. Ricchetti’s use of census racial demographics to analyze differences in crime across neighborhoods (what Defendants call “census benchmarking”) “is not a generally accepted method for studying traffic enforcement and has been the subject of intense scrutiny for decades.” Defs.’ Motion, at 17. Second, Defendants claim that Dr. Ricchetti’s regression model does not properly take into account factors related to driving behavior. *Id.* at 17-20. Both of these claims are incorrect and are based on misunderstandings and mischaracterizations of Dr. Ricchetti’s methodology.

1. Dr. Ricchetti Properly Used Census Demographic Data In His Regression Model

Contrary to Defendants’ assertions, the use of demographic data across census tracts for the purpose of analyzing claims of racial discrimination is widely used in academic literature and accepted by courts. According to Dr. Justin McCrary, an expert on academic literature concerning statistical analysis of racial discrimination, “the literature on crime and policing regularly leverages different levels of crime and policing across different geographic areas

total number of roadblocks, rather than the more informative figure of roadblocks per 1,000 residents (which is the metric Dr. Ricchetti used).

(cities, counties, etc.) to understand the relationships between crime, policing, and local characteristics of different geographic areas.” Ex. 3, McCrary R.R. ¶ 22. Dr. McCrary’s expert report describes several peer-reviewed studies that use methodology similar to Dr. Ricchetti’s methodology. *Id.* ¶¶ 21-25.

Courts have also accepted methodology similar to Dr. Ricchetti’s methodology for purposes of analyzing claims of racial discrimination in law enforcement. For example, in *Floyd v. City of New York*, the plaintiffs’ expert, Dr. Jeffrey Fagan, “ran regressions that sought to determine the impact of a person’s race on outcomes such as being stopped, being frisked, being subjected to force during an arrest, etc.” 861 F. Supp. 2d 274, 281 (S.D.N.Y. 2012). Dr. Fagan’s methodology was based on a methodology he had published in peer-reviewed studies. Dr. Fagan sought to control for the possibility that Blacks and Hispanics disproportionately live in higher crime neighborhoods in New York. *Id.* Accordingly, Dr. Fagan “used two variables in constructing a benchmark . . . : the local rate of crime and ***the racial distribution of the local population.***” *Id.* (emphasis added). Dr. Fagan’s methodology was analogous to Dr. Ricchetti’s methodology. *See* Ex. 3, McCrary R.R. ¶ 21 (“As in Dr. Ricchetti’s model, Fagan et al. examined whether the intensity of a particular type of policing effort varied across neighborhoods based on the racial distribution of *the residents* in that neighborhood given the level of relevant crimes committed in those neighborhoods.”); Ex. 2, Ricchetti R.R. ¶ 30. In *Floyd*, the defendants sought to exclude Dr. Fagan’s methodology, claiming that “it uses the wrong benchmark to measure bias.” *Floyd*, 861 F. Supp. 2d at 288. Specifically, the defendants claimed that Dr. Fagan improperly relied on local demographic characteristics and local crime rates instead of statistics about crime rates across different racial groups. The court rejected the defendants’ argument, noting that Dr. Fagan’s model was based on “methodologically sound analyses” and properly

accounted for differing criminal behavior among different races. The court stated that the defendants may present their own evidence and may challenge Dr. Fagan's testimony on cross-examination, "[b]ut they may not prevent plaintiffs from presenting those opinions in the first place." *Id.* at 290.

Defendants' arguments about "census benchmarking" focus on the impropriety of using demographic data as the *sole* benchmark for determining whether law enforcement is engaged in discrimination against a particular group of people. However, Dr. Ricchetti's multiple regression model *did not* rely solely on census racial demographics as his benchmark. Instead, his model accounted for several other factors that might provide non-race-related reasons for differences in the frequency of MCSD roadblock locations across census tracts. Specifically, Dr. Ricchetti accounted for (1) DUI arrests per 1,000 people; (2) Traffic arrests and citations per 1,000 people; (3) Percentage of households with at least one vehicle; (4) Percentage of population between ages 15-24; (5) Median household income; and (6) Unemployment rate. *See* Ex. 1, Ricchetti Rep. ¶ 45. Thus, Dr. Ricchetti's methodology differs materially from the methodology rejected in the portion of *United States v. Johnson* cited by Defendants. 122 F. Supp. 3d 272 (M.D.N.C. 2015). In *United States v. Johnson*, the court rejected an analysis comparing the percentage of checkpoint stops involving Hispanics to census data showing the Hispanic percentage of the general population and the driving age population. The court noted that a comparison of the percentage of Hispanics subject to checkpoint stops with the percentage of Hispanics in the general population (or driving-age population), does not by itself provide a reliable basis for showing discrimination because it does not control for other variables that might explain differences in the racial composition of checkpoint stops. *Id.* at 359. The analysis rejected by the court in *United States v. Johnson* is nothing like Dr. Ricchetti's analysis, which used a widely

accepted methodology to control for several factors, including (as detailed below) direct measures of the driving behavior of motorists.

2. Dr. Ricchetti Properly Controlled For Driving-related Variables.

Defendants specifically fault Dr. Ricchetti for allegedly (1) “us[ing] residential population as a proxy for drivers on the road” and (2) failing to “develop a model and benchmark that considered all contextual factors relevant to catching impaired drivers and the profile of drivers on Madison County’s roads.” Defs’ Motion, at 17. Both of these criticisms are inaccurate and unavailing.

Dr. Ricchetti’s model does not use the percentage of Black residents as a proxy for the percentage of Black drivers. *See* Ex. 2, Ricchetti R.R. ¶ 16. Instead, Dr. Ricchetti’s model assesses whether, controlling for driving-relating behaviors (such as DUI arrests), MCSD conducted roadblocks more frequently in parts of Madison County with a higher share of Black residents. *Id.* ¶ 18. The percentage of Black residents is relevant because Plaintiffs claim that “MCSD disproportionately establishes roadblocks in particular residential neighborhoods.” *Id.* ¶ 17. Nonetheless, because MCSD claims that its roadblock practices are based on driving behavior, Dr. Ricchetti’s model also controlled for several driving-related factors. Thus, Dr. Ricchetti’s model sought to determine whether roadblocks were disproportionately more frequent in Black neighborhoods even after taking into account the possibility that those neighborhoods have a higher rate of dangerous or illegal driving behavior.¹⁵

¹⁵ Defendants contend that “census data is not just unreliable as a benchmark for the driving population, it is also unreliable as to the actual residents also. . . . Census tract data by its very nature assumes the population within the tract is homogenized and that the racial distribution of the population is even within [each] tract.” Defs’ Motion, at 20. However, this critique ignores the fact that census tract data and data from other geographic units (such as cities or counties) is routinely used in academic methodology. *See* Ex. 2, Ricchetti R.R. ¶ 35. “The use of census tract level data—or county data, or city data, or state data—is common in academic research, and is in no way invalidated because the values of variables vary within a census tract (or county or city or state). This feature of data is true for any variable that is analyzed at an

Defendants claim that Dr. Ricchetti’s model failed to “consider[] all the contextual factors relevant to catching impaired drivers and the profile of drivers on Madison County’s roads” because Dr. Ricchetti’s analysis did not “consider the location of bars, restaurants, nightlife, and entertainment areas.” Defs.’ Motion, at 17. However, each of the factors Defendants cite are only indirect (at best) measures of risky driving behavior. Rather than using these indirect measures, Dr. Ricchetti accounted for *direct* measures of risky driving behavior, including DUI arrests and traffic-related arrests and citations. Ex. 2, Ricchetti R.R. ¶ 6; *see also* Ex. 3, McCrary R.R. ¶ 19 (“While Dr. Steward emphasizes the importance of DUIs in the establishment of roadblocks (calling it ‘the key factor’), Dr. Ricchetti’s model controls for DUIs. Thus, contrary to Dr. Steward’s claims and consistent with the literature, Dr. Ricchetti controls for the relevant behavior of driving population in each census tract, given the focus on roadblock policing.”). Dr. Steward has provided no support for his assertion that his proposed indirect measures of risk driving behavior are superior to the direct measures Dr. Ricchetti used in his

aggregate geographic level, such as census tract, county, city, or state level. Consequently, statistical analyses comparing differences across neighborhoods in policing or any other outcome of interest can be a reliable methodology.” Ex. 3, McCrary R.R. ¶ 31. Moreover, differences in demographic data within a census tract is a “type of measurement error that does not create bias in favor of finding a statistically significant coefficient in a regression analysis.” *Id.* ¶ 32. Instead, “if anything this type of measurement error typically makes a model like Dr. Ricchetti’s conservative.” *Id.*

In at least one prior case, Dr. Steward himself has “relied on comparisons of arrest data across geographic areas much bigger than census tracts in a benchmarking analysis”. Ex. 3, McCrary R.R. ¶ 31. In *Kelly v. Paschall*, Civil No. W-03-CA-179, 2005 WL 5988648, *3 (W.D. Tex. Apr. 19, 2005), Dr. Steward “conducted a statistical analysis of the [Central Texas Regional Narcotics] Task Force’s investigations and arrests and then compared those numbers with the numbers from several other law enforcement agencies in Texas. As a result, he determined that there was a statistical difference between the racial composition of the Task Force’s cases and all the other law enforcement agencies that he compared with the Task Force.” *Id.* at *3. The defendants argued that “there should have been adjustments made because there are differences between the socioeconomic characteristics of the [broader region] and those in certain towns of the Task Force’s jurisdiction.” *Id.* However, as the court noted, the “solution is to do exactly what Dr. Steward did in this case: to use several different baseline comparators to ensure that any differences are taken into account.” *Id.* at *3.

model. Indeed, at his deposition Dr. Steward was unable to provide any specific basis or cite any economic literature supporting his assertion that there is a relationship between drunken driving and the locations of boating and recreation areas, let alone that these factors are better measures of drunken driving than DUI arrest data. *See, e.g.*, Ex. 8, D. Steward Tr. 234:2-16 (“Q. And in terms of saying that it should be reasonable to expect that there’s likely a relationship here, can you point to any literature, any sort of sources that you reviewed, that support that there should be a correlation between these aspects? . . . A. All I can say right now is it exists. I can’t identify them as I sit here. You just would need to look at the demographics of the particular event that you’re looking at. You could look at traffic surveys in particular. These are things that Dr. Ricchetti could look at. But as I sit here, I don’t have a report to point him to to fix that particular issue.”).¹⁶

3. The Alleged Flaws In Dr. Ricchetti’s Regression Methodology Do Not Affect His Conclusions

Defendants do not plausibly explain how, if at all, Dr. Ricchetti’s analysis would be different if he changed his methodology to address Defendants’ critiques. Alleged errors in statistical analysis do not render that analysis inadmissible unless those “alleged errors would affect the underlying results.” *Kelly v. Paschall*, 2005 WL 5988648, at *4; *see also Bazemore v. Friday*, 4478 U.S. 385, 401 (1986) (“Normally, failure to include variables will affect the

¹⁶ Dr. Steward’s assertions about the statistical impact of accounting for entertainment and recreation areas is also unsound because he did not use a reliable methodology to identify these areas. Instead, he appears to have relied on MCSD’s identification of locations. *See* Ex. 8, D. Steward Tr. 236:4-236:16 (Q. [Y]ou didn’t actually go and try to figure out where . . . boating and recreational areas were in relation to roadblocks from the data that you were looking at? . . . A. Again, as I was saying before, I didn’t perform an analysis in this case. What I’m saying is I did look at that through Dr. Ricchetti’s analysis. I didn’t do a separate analysis. I looked at Dr. Ricchetti’s analysis and where he put the roadblocks and where they were in relationship to bars. I didn’t do anything separate in this analysis.”). Moreover, using the locations of bars in Madison County as a variable is flawed to the extent it does not account for potential drunk drivers returning from bars outside of Madison County (in Jackson, for example) or house parties.

analysis’ probativeness, not its admissibility”). While Dr. Steward admits that he did not conduct any independent analysis, he attempts to poke holes in Dr. Ricchetti’s findings by claiming that “Dr. Ricchetti performs no statistical test to determine what effect the factors that he omits from his analysis have on his findings.” Ex. 5, Steward R.R. ¶ 74; *see also, e.g.*, Ex. 8, D. Steward Tr. 246:16-19 (“Keep in mind I’m not doing a separate analysis. I’m looking at what Dr. Ricchetti did.”). Dr. Steward also claims that “for instance, simply accounting for bar and boat areas in [Dr. Ricchetti’s] analysis shows there is no statistically significant difference between the number of traffic roadblocks in low and high African-American population areas in any year.” Ex. 5, Steward R.R. ¶ 75. Both of these assertions are incorrect and misleading.

Contrary to Dr. Steward’s claim, Dr. Ricchetti analyzed the potential effect of factors not included in his model and determined that the regression analysis would be unlikely to change if additional factors were considered. Specifically, Dr. Ricchetti observed that his model’s “R-Square,” “a statistic that helps measure how well the control variables in the regression model explain the frequency of roadblocks across the different census tracts,” was “relatively high.” Ex. 2, Ricchetti R.R. ¶ 40. Dr. Ricchetti also conducted sensitivity analyses to “assess the overall pattern of the coefficient as more variables are added, and other changes are made to the model.” *Id.* ¶ 41. Dr. Ricchetti found that “across all such sensitivities, the coefficients are statistically significant and stable.” *Id.* In other words, the correlation between race and roadblocks is not explained by variables (such as boating areas and bars) omitted from Dr. Ricchetti’s regression model. As Dr. Ricchetti points out, this is not surprising because, once one controls for the most significant determining factors of roadblock locations, such as DUIs, “[a]dding other factors to the regression should not be expected to change the results once the key factor is considered.” *Id.* ¶ 37.

Dr. Steward's claim that Dr. Ricchetti's results would change if the model accounted for bar and boating areas is misleading. Dr. Steward's claim has nothing to do with the explanatory power of bar or boating areas. Rather, it is based on the fact that Dr. Steward conducted an analysis "in any year." Ex. 5, Steward R.R. ¶ 75. "Instead of running his sensitivity analysis on the full six years of data used in [Dr. Ricchetti's analysis] (126 data points), Dr. Steward [ran] a separate regression for each year from 2011-2016, each of which has only 21 data points." Ex. 2, Ricchetti R.R. ¶ 13. In other words, Dr. Steward obtained his results by effectively "throw[ing] out 80 percent of the data." *Id.* When Dr. Ricchetti accounted for bar and boating areas in the way Dr. Steward suggests *for the full six-year period*, Dr. Ricchetti found "a *statistically significant* relationship between the share of the population that is Black and the frequency of roadblocks that is slightly larger in magnitude than [Dr. Ricchetti's own] model." *Id.*

D. Dr. Ricchetti's Results Could Not Be The Result Of Random Chance.

Dr. Ricchetti's multiple regression analysis found that "the effect of the percentage of Black residents is statistically significant and positive at less than the 5% level" and that "[t]hese results indicate that, even after controlling for variables that are predictive of differences in traffic behavior roadblocks are statistically significantly more likely to occur in areas with a higher percentage of Black residents." Ex. 1, Ricchetti Rep. ¶ 46. Dr. Ricchetti's finding that race is a statistically significant factor means that the correlation between the Black population percentage of census tracts and the frequency of MCSD roadblocks is not due to random statistical variation. Nonetheless, the final section of Defendants' brief makes the sweeping assertion that Dr. Ricchetti's regression analysis is of no benefit because the results of his analysis "are equally as likely to be the result of random chance." Defs.' Motion, at 20.

First, the portions of Dr. Steward's report cited in Defendants' brief mischaracterize the nature and purpose of Dr. Ricchetti's descriptive analysis. As explained above, in Section II.B,

descriptive analysis is a common and standard feature in academic research regarding statistics. Dr. Steward faults Dr. Ricchetti for not testing the statistical significance of Dr. Ricchetti's descriptive analysis but ignores the fact that Dr. Ricchetti did in fact conduct a statistical significance test in connection with his formal analysis—the multiple regression model.

Second, Dr. Steward makes a series of errors in connection with his incorrect claim that Dr. Ricchetti's finding of a relationship between race and roadblocks is *de minimis* because “Dr. Ricchetti's conclusion is that if the African-American population for a census tract increased by 1% per year, then there would be .06 more roadblocks in that tract per year” and “it would take sixteen years for there to be an additional roadblock in that given tract.” Ex. 5, Steward R.R. ¶ 19. Dr. Steward's claim is the result of multiple mathematical errors. *See* Ex. 2, Ricchetti R.R. ¶¶ 23-25. Dr. Steward's focus on the effect of a 1% change in the Black population in a census tract fails to account for the fact that the difference in Black population percentage varies by nearly 80 percentage points across census tracts in Madison County (11%-89%). The relevant question is not how many extra roadblocks would be implemented if a census tract saw a 1% increase in the Black population; it is instead: how many more roadblocks occurred in census tracts with a high Black population percentage relative to those with a low share? As Dr. Ricchetti explained in his first report, and again in his Rebuttal report, a census tract that is 80% Black will have “about 112 more roadblocks in total over the 6 years of data” relative to a census tract in which 20% of the population is Black. Ex. 1, Ricchetti Rep. ¶ 46; Ex. 2, Ricchetti R.R. ¶ 25.¹⁷

¹⁷ In his example of a census tract that increased its Black population by 1% for 16 straight years, Dr. Steward also fails to account for the cumulative effect of differences in the Black population percentage over time. Correcting for this error reveals that an average census tract in which the Black population percentage grows at 1% per year would see *42 additional roadblocks* over 16 years, not 1 as Dr. Steward claims. *See* Ex. 2 Ricchetti R.R. ¶ 24 n.28.

Finally, Defendants improperly seek to dismiss Dr. Ricchetti's findings because Dr. Ricchetti's "models clearly indicate that DUI activity, and not the race of Madison County, is the determining MCSD traffic roadblock factor." Ex. 5, Steward R.R. ¶ 68. Dr. Steward, however, provides no basis for his apparent claim that only the variable with the most explanatory power is statistically significant. In fact, such a claim is contrary to fundamental and generally accepted statistical principles. *See* Ex. 2, Ricchetti R.R. ¶ 27. In the discrimination context, it is not unusual for variations in a particular activity to be explained in part by factors suggesting a lawful purpose and in part by factors suggesting a discriminatory purpose. For example, a statistical study of mortgage redlining (*i.e.* offering worse mortgage terms to Black people) might find a strong correlation between mortgage terms and poverty. However, the same study might also find a statistically significant relationship between mortgage terms and race even when controlling for poverty, which then provides evidence of racially discriminatory practices. Here, it is not surprising that the locations of roadblocks with an overtly proper purpose (*i.e.* DUI enforcement) will be correlated with DUI arrests. The key finding of Dr. Ricchetti's analysis is that there was *also* a statistically significant correlation between MCSD roadblocks and racial demographics. This correlation cannot be explained by a proper policing purpose and supports Plaintiffs' claims that MCSD engages in racially discriminatory policing practices.¹⁸

¹⁸ It is also important to note that controlling for DUIs may cause Dr. Ricchetti's analysis to *understate* the relationship between roadblocks and Black population. This is because, to the extent there is a disproportionate presence of roadblocks in census tracts with a higher Black population, there may also be a disproportionate number of DUI arrests in those tracts relative to census tracts with a lower Black population. *See* Ex. 2, Ricchetti R.R. ¶ 15 n.23.

CONCLUSION

For the foregoing reasons, Plaintiffs respectfully request that this Court deny in its entirety Defendants' *Daubert* Motion and Motion *In Limine* to Exclude the Expert Testimony Bryan Ricchetti.

Dated: July 2, 2018

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CERTIFICATE OF SERVICE

I hereby certify that on July 2, 2018, I caused the foregoing **PLAINTIFFS'**

**MEMORANDUM OF LAW IN OPPOSITION TO DEFENDANTS' *DAUBERT* MOTION
AND MOTION *IN LIMINE* TO EXCLUDE THE TESTIMONY OF BRYAN RICCHETTI**

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